

#### US005646817A

# United States Patent [19]

### Manser et al.

[11] Patent Number:

5,646,817

[45] Date of Patent:

\*Jul. 8, 1997

[54]	ADJUSTABLE KEYBOARD		
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[*]	Notice:	The term of this patent shall not extend beyond the expiration date of Pat. No. 5,596,480.	

[21] Appl. No.: 614,481

[22] Filed: Mar. 13, 1996

# Related U.S. Application Data

[63]	Continuation of Ser. No. 213	3,625, Mar. 28, 1994.
[51]	Int. Cl. <sup>6</sup>	G06F 1/16
[52]	U.S. Cl	<b></b>
[58]	Field of Search	345/168, 169;
		00/472, 489, 682, 691–693;
	341/22; 312/	223.2; 235/145 R; 361/680

#### [56] References Cited

#### U.S. PATENT DOCUMENTS

3,940,758	2/1976	Margolin 345/169
3,990,565	11/1976	Felton et al 400/682 X
4,571,456	2/1986	Paulsen et al
4,597,681	7/1986	Hodges 341/22 X
4,661,005	4/1987	Lahr 400/682 X
4,704,604	11/1987	Fuhs.
4,824,268		Diernisse .
4,903,221	2/1990	Krenz.
5,067,834	11/1991	Szmanda et al 361/680 X
5,073,050	12/1991	Andrews .

5,122,786	6/1992	Rader 345/168
5,160,919	11/1992	Mohler et al
5,178,477	1/1993	Gambaro .
5,198,991	3/1993	Pollitt 361/680
5,424,728	6/1995	Goldstein 400/472 X
5,454,652	10/1995	Huellemeier et al 400/489

#### FOREIGN PATENT DOCUMENTS

5-189084 7/1993 Japan . WO92/11623 7/1992 WIPO .

#### OTHER PUBLICATIONS

"What? More New Macs?", Crystal Waters, Home Office Computing, (Jun. 1993, p. 40).

"Practical design aligns hands, wrists . . . " Product Feature (undated).

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#### 57] ABSTRACT

An adjustable keyboard assembly for a portable personal computer includes a keyboard, split along a predetermined breakline defining two keyboard sections, removable from the portable personal computer. In order to facilitate angular positioning of the keyboard sections as well as removal of the keyboard sections from the portable personal computer housing, the keyboard sections are mechanically coupled together, for example, with a hinge at one end of the breakline. Such a configuration enables the relative angular positions of the keyboard sections to be custom positioned by the individual user for maximum adjustability in accordance with the user's preference both on and removed from the portable personal computer housing. Unlike other known keyboards, the keyboard, in accordance with the present invention, is formed in standard QWERTY format so as not to require retraining of users.

## 21 Claims, 5 Drawing Sheets

